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A CONTRIBUTION TO ETHNOBOTANY

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In the year 1891, at my suggestion, the late J. G. Owens began a collection of data relating to Tusayan ethnobotany. It was my intention to prepare with him an elaborate memoir on the foods and food resources of the Hopi Indians, but the death of this talented young student prevented the completion of our work together. Since his death, however, my interest in the subject has not flagged, but I have found the accumulation of material* so vast that an extensive article would be necessary to present the subject in anything like a complete form. The portion dealing with maize and food products from it would alone fill a volume, and the various kinds of animal foods would take many pages to adequately discuss. The present article is offered as a contribution to the study of a few Tusayan plants, and is more or less preliminary in nature.

The specimens were identified for me by the late Dr Sereno Watson, of Harvard University, and have been deposited in the herbarium of that institution. I have had the aid of the late Mr A. M. Stephen in some of the etymological suggestions, but in many instances it has been quite impossible to arrive at any satisfactory analysis of the components of Hopi names of plants. It may seem strange to the reader that I have picked out a few of the plants used by the Hopi for alimentary, medicinal, and other purposes and omitted others equally important. It is not my intention to offer a monograph of the subject, nor would the limits of an *Anthropologist* article allow it. I simply wish to call attention to the interesting field of ethnobotany which the Hopi Indians furnish the ethnologist, leaving the more systematic and exhaustive discussion to a memoir which I have in preparation. The reason I have chosen the food plants instead of food animals will be patent when we call to mind that the Pueblos are and have been agriculturists, so far as our knowledge of them goes. They took to agricultural products rather than to flesh for their subsistence. I believe they have employed for food as large a

*Parts of this material were collected while at work for the Hemenway expedition and portions as special ethnologist of the Smithsonian Institution.

number of plants as any of the aborigines of America, and that they have more than once bridged over the failure of their staple crop, maize, by other plant foods not used by the whites for food. It is certainly important to know what these other food plants are, but the bearings of this on the food resources of the great American desert I must reserve to my final discussion.

Gutierrezia euthamiae. (Hopi name, *Pamnavi*: from *pami*, assuredly; *mana*, maid; *übi*, axil—the true female plant.)—A sprig of this plant is attached to the paho, or prayer emblem. (See Journ. Am. Eth. and Arch., vol. iv, p. 27.)

Thelesperma gracile. (*Hohoisi*: from *hohovaktü*, sweet smells; *sihü*, flower.)—An infusion of the flowers is drank as a beverage. A stronger infusion is used in the liquid in which the Hopi boil yucca fiber, for basketry, until they acquire a reddish-brown color.

Biscutella wislizeni. (*Kütcibcü*: from *kütca*, white; *cibuci*, seed.)—The dried leaf is presumed to have healing properties. When used it is commonly rubbed to a powder and sprinkled on abrasions.

Stanleya sp. (*Kwibi*).—In the spring its leaves are boiled and eaten.

Stanleya albescens. (*Ishü*: from *isauüh*, coyote; *cühü*, hay.)—Used as a food, like *kwibi*.

Sisymbrium canescens. (*Asa*: etymology obscure.)—It gives its name to a clan who now regard themselves as Hopi, but traditionally claim to be of Tanoan stock. Soon after people came up from the Underworld and were yet wandering in search of permanent dwellings some women daily plucked the flowers of this plant, fluttering their yellow blossoms in the faces of the infants cradled on their backs to still their cries. These infants became known as the "Children of the Asa," and their descendants have ever since been called the "Asa people." An infusion of the flowers of this plant is used to mix with a dark iron pigment, forming a black color for pottery decoration. The juice of the *asa* is presumed to cause the pigment to adhere. It is also used as a food, its leaves either boiled or roasted between hot, flat stones.

Portulaca retusa. (*Pihala*: from *piakü*, caterpillar.)—This plant is likewise called *piakü käüadta*, caterpillar, his corn; it is boiled with meats.

Delphinium scaposum. (*Tcorosi* : from *tcoro* (*Sialis arctica*) *sihü*, flower—bluebird flower.)—The Flute priests gather its petals and seeds; the maids of their families grind them on the mealing-stones, making a very fine blue meal conventionally called *cakwatalasi*, blue pollen; prescribed for the Flute altar.

Physaria newberryi. (*Hohoyaña* : from *hohoyüih* (*Asida rimatu*), the prayer beetle, alluding to the kneeling posture which it assumes when disturbed; *ña* from *ñahü*, medicinal charm or root.)—This plant is one of the ingredients of the snake charm, or antidote drank after the snake dance by all who have taken part as snake priests.

Cleome integrifolia. (*Tümi* : from *tüwa*, land (sand); *hümita*, corn kernel.)—The boiled leaves and flowers are highly esteemed.

Sphæralcea incana. (*Kopoña* : from *poña*, round, abdomen; *ñahü*, charm.)—A diarrhoea antidote.

Rhus trilobata. (*Cübi* : from *cükü*, pungent, alluding to its acid berries, which are called *sivwipsi*; a syncopated form of *cübisiadta*, *cübi*, its seeds.)—They are eagerly eaten by young people. Its twigs are used for many ceremonial purposes; also for coarse basketry. The buds are regarded as medicinal. The dry shrub is one of the four prescribed fuels for the kivas.

Dalea lanata. (*Kücüña* : from *kütca*, white; *ña*, root.)—The root is white and after scraping is eaten as a sweet.

Astragalus pictus filifolius. (*Pacipña* : from *pahü*, water; *cüwipa*, straight; *ña*, root.)—Its long, straight roots, dug and gathered after rain, are eaten as a sweet, especially by women and children.

Ribes cereum. (*Yowipsi* : from *yowi*, the tassel on the maize ear; *sihü*, flower : maize tassel flower.)—The shrub is in blossom when the tassel comes on the corn. The berries are eaten.

Enothera pinnatifida. (*Bolisi* : from *boli*, butterfly; *sihü*, flower. The term *boli* is also applied to a maid of marriageable age.)—Maids deck their hair with this flower on holidays.

Muhlenbergia pungens. (*Wügsi* : from *wügti*, woman; *sihü*, flower, a satiric name.)—The women use it as a brush, the same bunch of grass serving a double purpose; with the stiff end they brush the hair and with the more flexible tip end they sweep the floor.

Pinus monophylla. (*Tuvaü* : from *tüwa*, nut; *kohu*, wood.)

Opuntia. (*Yüñü*.)—In the spring and early summer the succulent stem is boiled, divested of its spines, and eaten.

Yucca angustifolia. (*Mohü*.)—Its soapy root is called *mohü-mobi*.

Yucca baccata. (*Samóá*.)—Its edible fruit is called *sahü*; its soapy root is called *samomobi*. All the yucca plants are used for basketry and a multitude of other purposes.

Artemisia tridentata. (*Napaliñña*: from *napala*, a term applied to an ailing person lying on a mat, *apa*; *ñahü*, charm.)—An infusion of its leaves is drank by a person whose ailment is supposed to lie in his ilium.

Panicum capillare. (*Ninü*: from *nücyüka*, food.)—Its seeds are ground and mixed with corn meal.

Panicum autumnale. (*Patüca*: from *pahü*, moisture, water; *tüca*, grass.)

Hilaria jamesii. (*Takachü*: from *taka*, man; *cühü*, a wiry grass; the male *cühü*.)—The grass which the Hopi assume to be the female *cühü* is used by the women in making the coil trays, called *poota*, for which Tusayan is famous.

Equisetum lævigatum. (*Pona*: from *pono*, round, referring to the impression made with the end of its tubular stem on the skin or on clay vessels, a common form of primitive decoration; see median facial line of Humis-katsina helmets.)—It is dried and ground with corn meal to make a ceremonial bread called *ponoviki*.

Allium vineale. (*Asoci*.)

Scirpus lacustris. (*Mümüzri*.)—The bean in Hopi is *müzribuci*, from *c'ibuci*, seed, and *müzirina*, to roll or mould a plastic substance in the palms of the hands. The bean pod bears these marks, but why the term rolled should be applied to this scirpus is not evident.

Oryzopsis cuspidata. (*Lehü*: possibly from *leñya*, flute, reed whistle; *cühü*, hay.)—It gives its name to one of the clans in the group with which the Flute clan is associated.

Euphorbia parryi. (*P'yüñña*: from *pihü*, milk; *ñahü*, charm.)—This name is given also to *Asclepias verticillata*, q. v.

Juniperus occidentalis. (*Hoko*: from *hohü*, arrow; *kohü*, wood.)—So called because its wood splits into straight arrow-like fragments; it is frequently called *hotcki*, referring to the entire tree.

Calochortus aureus. (*Hesi*: from the form of the flower with protruding lips like those on grotesque masks.)—Its petals and seeds are ground to a fine meal like those of *tcorosi*; the meal is called "yellow pollen" and is mixed with maize pollen and used in the Flute ceremonial; its root is eaten raw.

Asclepias speciosa. (*Coya*).—The Hopi word *coya* is the name of the planting stick, and is applicable to this plant in allusion to its stiff, straight stalk. Its leaves and the young shoots are boiled with meat as a food.

Asclepias verticillata. (*Piyüña*: from *pihü*, milk; *ñahü*, charm.)—When a nursing mother has a scanty flow of milk, she boils the entire plant and drinks the infusion.

Sarcobatus vermicularis. (*Teve*).—This is one of the four prescribed shrubs for *kivamya kohü* (kiva fuel) and the principal one used.

Chenopodium leptophyllum. (*Tcatcak tübhü*: from *tcatcak*, the plural (reduplicated) of *tcaka*, little.)—The seeds are minute. See *tübhü*.

Chenopodium album. (*Cirswa*: from *Cisrotañwa* (?), a liquid trickling down a vertical surface; its stalk has vertical streaks of red color.)—Its leaves are boiled and eaten with fat.

Chenopodium fremontii. (*Wupa tübhü*. See *Tübhü*; *wapa*, long.)

Chenopodium cornutum. (*Kotoki*: a modification of *kütüki* popcorn; *kütüki* is a syncopation of *kai tyükai*, corn speaks, in allusion to the sound made by the maize as it decrepitates.)—This "popcorn-plant" is so named because they say it flings its ripe seeds abroad like decrepitating corn flying out of a vessel held over a hot fire. Its seeds are ground and mixed with corn meal to make *somipiki*, small dumplings wrapped in corn husk and tied with a shred of yucca.

Amarantus blitoides. (*Pociüh*).—Formerly its seeds were prized as a food.

Amarantus torreyi. (*Wiwa*: from *wiwai*, to stumble, alluding to its procumbent stems tripping the foot of the passer.)—Its leaves boiled and eaten with meat.

Amarantus paniculatus. (*Komo*).—The seeds first obtained from Spaniards or Mexican villages. An infusion of this plant is used to impart a red color to the piki or paper bread distributed at katecina exhibitions.

Monarda citriodora. (*Nanakopsi*: from *nanakopatcokta*, a plural term describing the position of the flowers on the stalk, "one perched above the other;" *sihü*, flower.)—This plant is gathered by those engaged in a *sowimakiwa*, hare-hunt. It is boiled and eaten only with hares.

Poliomintha incana. (*Müüñ'tochabvü*: from *üüñña*, salt (*üñwa* blood; *ñahü*, charm); *toñtoina*, to dip.)—The name describes the manner in which the plant is dipped in *üñackiüi*, salted water, when eaten.

Mentha canadensis. (*Pamüüñ'tochabvü*: from *pahü*, water, and the same etymology as the plant last mentioned.)—This is eaten as a relish.

Lygodesmia grandiflora. (*Müha*: from a syncopated form of *müyikiyuta*, descriptive of leaves spread out flat on the ground.)—Its leaves are boiled with meats and eaten.

Senecio douglasii. (*Müryitka*: from *müryi*, mole; *kaiü*, corn.)—Many plants are thus assigned to animals supposed to hold them in special favor. The Navajo call it cactus brush, its top being used to brush the spines from prickly pears, and the Hopi use it for the same purpose.

Artemisia dracunculoides. (*Lüktaukya*.)—The literal meaning of the Hopi term is "two groups of songs," but why this curious name was given has not been elicited. In the early spring its leaves are gathered and brought home, baked between hot stones, and eaten after dipping in salted water.

Castilleia linariæfolia. (*Mansi*: from *mana*, maid; *sihü*, flower.)

Castilleia affinis. (*Wupamansi*: from *wupa*, long, and *mansi*.)—This and *mansi* are used by Hopi maidens to deck their hair on holiday occasions.

Solanum jamesii. (*Tümna*: "a small nodule;" potato.)—It is boiled and eaten with a talc of greasy taste called *tümñ' tcúka*, "potato clay."

Nicotiana attenuata. (*Piba*: from *napi*, leaf; *pahü*, moisture.)—This tobacco is smoked in pipes on all ceremonial occasions and forms a part of nearly all prayer offerings.

Lycium pallidum. (*Keve*: signification unknown.)—The entire shrub is used at an annual ceremony called *Niman-katcina*, at which time numerous small, round disks of gourd are tied to its branches. The disks are painted in emblematic colors and called *pikapiki*. Its sweet berries, called *kebebsi*, are eaten from

the shrub; they are likewise mixed with "potato clay" and eaten with *piki*. It is said to be also regarded as a sacred plant by the Navajo.

Coriandrum sativum. (*Kuranto*: from the Spanish *coriandro*.)—The seeds were first obtained from some of the Mexican colonies. The plant is dipped into a stew and eaten as a condiment. It is not used medicinally.

Feniculum officinale. (*Kwañwa-piba*: from *kwanwa*, sweet; *piba*, tobacco; *piba*, from *nápu*, leaf; *pahü*, moisture.)—It is used as a substitute for *piba*, but never smoked ceremonially. The same term is applied to tobacco obtained from the whites.

Mentzelia albicaulis. (*Sale*: derivation obscure.)—Also called *huwikäi*, Dove's maize. The myth connected with the plant does not explain its name; the Dove called it *sale* when asked its name by a maiden. Its seeds are gathered by the girls in the afternoon, as it is asserted the seeds will not fall until the sun has passed half way over the sky. They are parched and ground into a fine sweet meal called *saletosi*; not made into a bread, but eaten in pinches from the wicker tray on which it is served.

Carthamus tinctorius. (*Asapzrani*.)—Said to have been obtained from the Mormons about twenty-five years ago. The word may be a Hopi pronunciation of "saffron." An infusion of the flowers is used to give a yellow color to the paper-bread called *piki*.

Bigelovia douglasii stenophylla. (*Maïvi*: *Üvi* is the axil of the lower or main branches of a tree or plant; the rest of the etymology obscure.)—The tips of this plant are chewed and spurted upon boils, in the belief that this treatment causes them to dry. It is regarded as the male of the herb *pamnavi* (q. v.).

Bigelovia howardii. (*Siwapi*: from *sikyañpu*, yellow; *wuwwapi*, whip.)—This is used by the "Flogger" to thwart children during certain initiatory ceremonials. An infusion of its flowers mixed with a chalky stone produces a bright yellow pigment used for personal decoration in ceremonies. The dried plant is one of the four prescribed kiva fuels.

Monolepis chenopodioides. (*Hüzrütubhü*.)

Suxda intermedia. (*Tcihteve*: from *tciitü*, birds; *teve*.)—The birds are said to be fond of its seeds.

Atriplex confertifolia. (*Hoyavako*: from *hovaktü*, sweet smells.)—The water in which the leaves of this plant have been boiled is

used to mix the corn meal for making the pudding called *ho-ya-vak-pikinni* (*piki amiyata*, *piki* or paper-bread, covered in). This meal pudding is poured into a large earthen jar and baked in the characteristic small cooking-pit common in Tusayan.

Atriplex argentea. (*Üñatki*: from *üüñña*, salt; *tcoki*, a term applied to an entire tree or plant growing in place.)—Its salty leaves are boiled and eaten with fat. This is the earliest of the six typical Hopi food-plants of the spring.

Eriogonum hookeri. (*Kalnabū*: from *kala*, rat; *nakabū*, ear, because the leaf is said to resemble a rat's ear.)

Eriogonum corymbosum. (*Powawi*: possibly from *powato*, a form of ceremonial purification in which this plant, or the food prepared from it, may have been used.)—Its leaves are boiled, and with a portion of the water in which they were boiled they are rubbed on the mealing-stone with corn meal and baked into a kind of bread called *powawio pikabiki*—patted or pressed *piki*.

Atriplex canescens. (*Cüovi*: from *cühü*, pungent.)—One of the four fuels prescribed for *kiva* fires.

Artemisia frigida. (*Küiñya*: from *küyi*, water; *ñaa*, root.)—A sprig of this plant is attached to the *paho* or prayer emblem and is regarded as efficacious in petitions for water.

LOUBAT PRIZE.—Three years ago Mr Joseph F. Loubat, of Paris, offered prizes of \$1,000 and \$400, to be awarded every fifth year to authors of the best works on the history, geography, archeology, ethnology, philology, or numismatics of North America within the period mentioned. A committee composed of Professor H. T. Peck, of Columbia College; Dr Daniel G. Brinton, of the University of Pennsylvania, and Professor Henry C. Adams, the latter of whom was awarded the prize in 1893, will adjudicate essays and works for the next award in 1898.

PYGMIES IN EUROPE.—Near Schaffhausen, Switzerland, the remains of four full-grown pygmies have been found. Professor J. Kollmann, in the *Journal of the Anthropological Institute of Great Britain* for November, assigns these remains to the neolithic period and states that they were found associated with skeletal remains of persons of normal size of the present European type.